

NORTH SAN GABRIEL RIVER BRIDGE
Texas Historic Bridges Recording Project II
Spanning the North Fork of the San Gabriel River at Business Rt. 35
Georgetown
Williamson County
Texas

HAER No. TX-97

HAER
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246-GEOTO,
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PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD
NORTH SAN GABRIEL RIVER BRIDGE HAER No. TX-97

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Location: Spanning North Fork of the San Gabriel River
at BU-35 (old SH 81) Georgetown, Williamson County,
Texas
UTM: North 14/626696/3391005
South 14/626696/3390864
USGS Quad: Georgetown, Tex.
(7.5-minute series, 1982)

Date of Construction: 1939

Designer: Texas Highway Department

Builder: Dean Word, San Antonio, Texas

Present Owner: Texas Department of Transportation

Present Use: Roadway bridge

Significance: A continuous bridge with a suspended span. The unique steel picket fence has a ring motif. Identical to the South San Gabriel River Bridge, except for some variation in the number of I-beams. The bridges are examples of an obsolete bridge technology. Replacing metal trusses at the same locations, the bridges served the needs of a rapidly expanding community; demonstrated the state's progress as it prepared for its Centennial; and met requirements of the nation's strategic defense program.

Historian: Peggy Hardman, Ph.D., August 2000

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In 1934, the Texas State Highway Department began experimenting with various ways to increase the length of the main span of steel bridges. Extending the steel girders beyond their supports, creating a cantilevered suspended girder, proved popular. The design allowed a longer span with thinner deck, thus reducing the number of supports needed, as well as the cost, an important consideration during the Great Depression. Both of the seven span, 367'-long San Gabriel River Bridges in Georgetown, Texas, were Federal Aid Projects (FAP 140 for the South San Fork bridge and FAP 260 for the North Fork bridge). Constructed in 1939 by San Antonio contractor Dean Word, the bridges opened to traffic the following year.¹

Built at the same time, the bridges spanning the South Fork (HAER No. TX-96), and North Fork (HAER No. TX-97) of the San Gabriel River are identical, except for the number of I-beams used. Both construction projects went to Dean Word; and both proceeded simultaneously to completion.

Placing a steel unit between cantilevered arms projecting beyond the main bridge supports creates the cantilevered suspended steel girder bridge. Riveted notched beam seats, or pin-and-hanger assemblies, connect the suspended span to the adjacent cantilever arms. Another good example of this now-obsolete design is the Nueces River Bridge in LaSalle County. It features a 291'-0" long riveted cantilevered suspended span, length including cantilever arms. Corrosion tended to affect the connections adversely. Refinement in field welding techniques also turned bridge builders away from the design.²

No bridges existed at these sites before the 1890s, despite requests by residents of the Georgetown area. On 18 October 1891, citizens demanded their leaders build a bridge across the larger streams of the area. The Chicago Iron Bridge Company received a contract to build several bridges. Across the forks of the San Gabriel at Georgetown, Pratt trusses went up. Unfortunately, a flood in 1921 washed out the bridges³. After repair, the bridges went back to work, and continued to carry traffic until the 1930s.

¹ Still in business, Dean Word is now located in New Braunfels, Texas.

² NRHP Eligibility Evaluation Report for the Bridges Crossing the North and South Forks of the San Gabriel River (Austin: Texas Department of Transportation, ca. October 1999).

³ Clara Stearns Scarbrough, *Land of Good Water: A Williamson County, Texas, History* (Georgetown, Tex.: Williamson County Sun Publication, 1973), 231-32, 437.

The "river binds Williamson County together the San Gabriel meanders, connects, and forms a distinct soul."⁴ Indeed, the confluence of the forks of the San Gabriel contributed to the community's recreational and cultural activities from its beginning. Williamson County, organized on 13 March 1848 and named for judge, Robert M. Williamson in one of numerous small communities that dotted the area along the San Gabriel. People needed good bridges to take them to and from their neighbors and businesses.

Though Williamson County was an agricultural area, the crop, cotton, produced little prosperity for its inhabitants. Cattle ranching proved more lucrative, as feeder routes of the Chisholm Trail crossed the area. After 1850, sheep raising and wool production increased in importance.⁵ Getting livestock to market warranted the construction of good water crossings, but when the railroad arrived in the 1870s, the clamor for sturdy bridges increased. Taylor, the county's third largest city, enjoyed the first railhead, and there, as in other Williamson County communities, cattle and sheep raising increased. Concomitant with sheep raising, mohair became an important commodity.⁶

The Great Northern Railroad, later consolidated with the Missouri Pacific, also led to the founding of Hutto and Round Rock. Proximity to the railroad also encouraged the development of commercial farming in eastern portions of the county. The sleepy village of Georgetown, became invigorated with the growing business climate.⁷ Southwestern University, the oldest college in the state of Texas, opened its campus there in 1873. The Georgetown Railroad began operating between the town and Round Rock in 1878, and the community embarked on its growth as a cultural and commercial center.⁸

Georgetown benefitted from its location between the forks of the San Gabriel River. Two miles northeast of town, San Gabriel Park opened in the late 1880s, and it still offers residents an idyllic country retreat. Twenty springs flow in and around the park which is dotted with cottonwood, pecan, and cypress trees. In the same decade, a magnificent suspension bridge carried pedestrians across the South Fork to the Chautauqua Assembly grounds. Unlike San Gabriel Park, the assembly grounds and its cultural programs became a memory. Water continued, however, to play an important role in the Georgetown community. Since the early 1900s, people in the area have enjoyed swimming at the Blue Hole Park on the south side of the South Fork of the River, and the Winford H. Bonner hike and bike trail follows the river under

⁴ Clara Stearns Scarbrough, *Land of Good Water: A Williamson County, Texas, History* 411.

⁵ Mark Odintz, "Williamson County," in *The New Handbook of Texas*, vol. 6 (Austin: Texas State Historical Ass'n, 1996 992-95).

⁶ Odintz, "Williamson County,"

⁷ Named for George Washington Glasscock, early settler who, in 1848, donated land for the town site. Clara Stearns Scarbrough, "Georgetown, Texas," in *The New Handbook of Texas*, vol. 3 (Austin: Texas State Historical Ass'n, 1996, 134).

⁸ Clara Stearns Scarbrough, "Georgetown, Texas," 134.

the existing bridges.⁹

Georgetown is on Texas' Meridian Highway No. 2C that begins at Temple, runs through Belton, Salado, Prairie Dell, Jarrell, Georgetown, Round Rock, Fiskville, and finally into Austin, where it connects again with Meridian Highway No. 2.¹⁰ As the city of Austin grew pressure increased on this roadway, and its bridges. The original Pratt trusses built over the river's forks faced tragedy within two decades of their construction. In 1921, floodwaters wrecked havoc on the bridges, washing out approaches and compromised structural integrity. One highway department engineer who worked on the bridges, worried about their continued weakness, and hoped the repairs would last at least six years.¹¹ More than one person with the highway department believed the South San Gabriel River Bridge really dangerous for heavy vehicles like motor busses.¹²

Two events of the 1930s further influenced the timing for the replacement of the old bridges. Texas used the full federal funds allocated for maintaining and building highways designated by the federal government as strategic defense roads. To be eligible for additional funding, the state needed to embark on its own road programs serving its large military population. Also, 1945 marked the Centennial birthday of the state. Old rickety bridges did not showcase the Lone Star's progressive road building program of the past two decades.

When war broke out in Europe in 1939, Texas became a land of military bases serving all branches; hence, state and federal leaders conferred to implement programs building and upgrading roadways and bridges linking military establishments. The increase in military personnel brought about a noticeable increase in highway traffic, and National Defense agencies designated 6,375 miles of the Texas Highway System part of the strategic military highway network. The mechanization of the military required that reinforcement units could be sent hundreds of miles within a day by highway to a danger zone. When the State Highway Department considered the elevated role of their roads and bridges, they discovered many inadequacies.¹³

Average daily peacetime traffic on the military priority one list in Texas stood at 1642 vehicles per mile. And, while the strategic network comprised only 27 percent of the state

⁹ Scarbrough, "Georgetown, Texas," 134. See also, NRHP Eligibility Evaluation Report; Scarbrough, *Land of Good Water*, 281, 434.

¹⁰ Joseph E. King, *A Historical Overview of Texas Transportation, Emphasizing Roads and Bridges* (Lubbock: Texas Tech University, Center for Historic Preservation and Technology, n.d.), 77-79.

¹¹ "Project Correspondence," 31 May 1935, Microfilm Roll No. 4115-B, 1937-1940, Texas Department of Transportation, Records Management Division, Austin, Tex.

¹² "Project Correspondence,"

¹³ *Texas Highway Department Twelfth Biennial Report* (Sept. 1, 1938 to Aug. 31, 1940), 2.

highway miles, those miles carried 55 percent of the highway system's normal traffic. For the state to meet the minimum standards required by the defense plan, it would have to spend about \$80 million dollars. Here, Congress stepped in. Road networks considered essential to the strategic plan received priority for federal funds. Under a matching fund system, Texas would receive about \$15 million dollars to bring designated roads up to par. The War Department estimated the work could be done in about six years.¹⁴ In conjunction with the Texas Good Roads Association, the Texas Highway Department lobbied the national defense agencies for additional federal dollars to hasten the construction of the military network.¹⁵

Although Georgetown and her San Gabriel River bridges lay on the military network of highways, as much interest went into the design of proposed new bridges. In keeping with the special sylvan and cultural environment of the community, people there insisted that new structures present not only an appealing appearance, and well-balanced design, but also fit harmoniously with the surrounding scenery. The Highway Department also suggested if, in a park or rail line, the bridge could be seen, then it should be artistic looking. Remembering the 1921 flood, the department further mandated greater attention be paid to adequate anchorage, that the bridges be secured in firm material in stream beds, preferably firm clay, shale, or rock.¹⁶

State Highway Engineer Julian Montgomery headed up the project. He succeeded Gibb Gilchrist in the position in October 1937, and brought with him experience as State Engineer and State Director of the Public Works Administration in Texas.¹⁷ Born in Whitewright, Texas, on 2 May 1889, Montgomery received a B.S. from Grayson College in 1908, a civil engineering degree from the University of Texas in 1912, and a M.S. from the University of Illinois in 1915.¹⁸

Before Montgomery, Gilchrist had begun a series of discussions about the bridges spanning the San Gabriel River. He initially hoped to only build one new bridge, and rather than replace that on the North Fork, widen its spans by modifying floor beams and lateral systems to accommodate a 24'-0" roadway. He also proposed keeping the sidewalk on the north side (proportion would be retained by having a sidewalk built on the south side of the proposed new

¹⁴ *Texas Highway Department*

¹⁵ *Texas Highway Department*

¹⁶ *Texas Highway Department*

¹⁷ Gibb Gilchrist served the Texas State Highway Department in a variety of capacities from the end of World War I until he left to become dean of the School of Engineering at Texas A&M in 1937. In 1944, Gilchrist became president of A&M; in 1948 the board of directors appointed him the school's first chancellor, a position he held until 1953. Gilchrist died at College Station, Texas on 12 May, 1972. Christina Irene van Doorninck, "Gibb Gilchrist," in *The New Handbook of Texas*, 3: 158-9

¹⁸ Montgomery's M.S. was in the field of Theory and Applied Mechanics.

South Fork bridge).¹⁹ After rethinking his proposal, Gilchrist wrote to Texas Highway Department Division Engineer Daniel E. H. Manigault, "it may be desirable to construct a new bridge [over the North Fork]."²⁰

Manigault proposed another reason to replace both bridges, the Texas Centennial. He probably wanted to take no chance an accident might occur on the old bridges at the time of the statewide birthday party. He wrote: "it is desirable . . . [the] bridges be built in the immediate future so they will be ready for the Centennial traffic." In 1938, the highway department agreed, but still sought to save at least one of the old Pratts. Engineer T. J. Kelley opined he hoped the existing bridge would be put on "some highway of lesser importance."²¹

In February of that year, bidding began for the contract for grading, and drainage structures. The contract went to Cage Brothers and L. A. Turner of Bishop, Texas, who had bid \$9,958.01. In December, Division Engineer Welborn wrote Montgomery not only about the slow progress, but also the extreme difficulty of moving heavy loads from north Texas to south Texas through the vicinity of Austin. He strongly urged the department replace the weak structures over the San Gabriel River before a serious accident occurred.²²

Welborn pushed the project ahead. In June 1938, Texas Highway Department engineers determined the South San Gabriel River Bridge unsafe for the heavy traffic crossing it daily.²³ In December, Don L. Hook, Texas Highway Department Resident Engineer, presented the Georgetown City Council with a proposal to build two new bridges located 400' from one another and spanning the north and south forks of the San Gabriel River.²⁴ The estimated cost would be \$91,000 for the South Fork bridge, and \$98,300 for the North Fork Bridge. Including

¹⁹ Microfilm Roll No. 4115-B, 31 May 1935.

²⁰ Microfilm Roll No. 4115-B, 1 August 1935. Daniel Elliott Huger Manigault, born 14 August 1866, in Charleston, South Carolina, spent most of his professional career working with various railroads as both resident and bridge engineer. He moved to El Paso also in 1901. There he worked with not only the railroads, but as an assistant engineer at the El Paso Smelter (ASARCO). He came to the Texas Highway Department in 1919 as a division engineer. He died August 25, 1953. "Daniel Elliott Huger Manigault," Application for Registration to Practice Professional Engineering," 21 December 1937.

²¹ Microfilm Roll No. 4115-B, 17 October 1935.

²² Microfilm Roll No. 4115-B, 28 December 1937.

²³ Microfilm Roll No. 4115-B, 8 June 1938.

²⁴ Don Leon Hook, born in Galveston, Texas, in 1893, received a B.S. in Civil Engineering from Texas A&M College in 1917. He worked in numerous Texas communities before taking the position as Resident Engineer for the Texas Highway Department in Williamson County in 1933. "Don Leon Hook, Application for Registration to Practice Professional Engineering," 27 December 1937.

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detour costs and salvage value from the old structures, the projected cost of \$234,675.00 was approved by the council.²⁵

The Pratt truss on the South Fork consisted of one 126'-0" steel truss span, one 115'-0" steel truss span, and six 19' timber spans. The bridge on the North Fork consisted of two 120'-0" steel truss spans, and two 41'-0" concrete girder spans. Both would be replaced with cantilevered suspended steel girder structures.²⁶ A call for bids went out. The project included removing the old trusses and their substructures, creating detour roads and bridges, and building the new bridges. Construction plans indicate that the substructures to be removed included wood and concrete abutments, masonry and concrete piers, and wood pile bents. Superstructure materials to be removed included the steel spans, wood and concrete approach spans, and sidewalks. The disposition of the materials to be left to the contractor.²⁷

Bidding companies included: Austin Bridge Company, Dallas, Texas; McKenzie Construction Company, San Antonio, Texas; P & B Construction Company, Fort Worth, Texas; J. F. Cage, Austin, Texas; L. E. Lacy, Dallas, Texas; Standard Paving Company, Fort Worth, Texas; Brown & Root, Inc., Austin, Texas; and W. W. Vann & Company, Kerrville, Texas. On 7 April 1939, Dean Word a contractor from San Antonio, Texas, received notification of winning the contract with his low bid of \$169,935.45.²⁸ Dean Word began in Louisiana in 1890 under the company name Word & Lee. Word moved to Texas in 1895, and according to his son, Tim Word, never worked outside of Texas again. Even today, some 90 percent of their work is done within an area bordered by Uvalde on the west, LaGrange on the east, Austin on the north, and San Antonio on the south.²⁹ Word put his Manager of Concrete Operations, Leo P. Cloud of San Antonio, and Ted Dewald in charge of much of the construction.

Once an effective detour went on-line, work on the new bridges commenced in earnest, and nearly one year from the date of contract, the North and South San Gabriel River Bridges opened to traffic. FAP 140-(B), the South San Gabriel River Bridge at Georgetown called for the concrete piers and abutment bents to be set into 2-1/2' solid rock.³⁰ Bridge members included one 10' 1-beam span, one 205' suspended 1-beam span unit consisting of one 56' suspended span

²⁵ Microfilm Roll No. 4115-B, 13 and 30 December 1938.

²⁶ Microfilm Roll No. 4115-B, 3 June 1938.

²⁷ *Plans of Proposed State Highway Improvement: Highway No. 2, North and South San Gabriel River Bridges and Approaches, Georgetown, 1939*, in the files of Texas Department of Transportation, Records Management Division, Austin, Tex.

²⁸ *Plans of Proposed State Highway Improvement*. A \$200,000 allotment had been set for the bids.

²⁹ Tim Word, telephone interview by author, 11 August 2000, Austin, Tex. Tim Word, son of Dean Word, is a third-generation contractor. He holds a civil engineering degree from Texas A&M University, and a MBA from Harvard Business School. Again, today the Dean Word Company is located in New Braunfels, Texas.

³⁰ According to a July 1939 memo, this went even deeper since a fissure was encountered at the 2-1/2' level.

with two 14'-6" cantilever arms flanked on either side by one 60' anchor arm and then three 40'-I-beams. The bridge length was set at 367' with a 43'-6" clear roadway and two 4' sidewalks.³¹ Cast bronze name plates, 11" x 12" x 1/4"-thick would be permanently affixed to both bridges.³²

There are minor deviations in the plans of the North Fork bridge. Its specifications called for three 40'-0" I-beam spans; one 60'-0" I-beam anchor span; one 85'-0" I-beam cantilever and suspended span; one 60'-0" I-beam anchor span; and one 40'-0" I-beam span. Sidewalk and roadway dimensions, however, mirror those for the South Fork structure.³³

Months of warm, clear weather aided the project. By 13 November 1939, the bridges stood at 87 percent complete. Of the 225 days allotted for the construction, Dean Word had used 168 thus far. The project remained on schedule. According to field notes, remaining work included installing railings, painting the steel, final finishing of the masonry, and rip-rap.³⁴

The railing is a distinctive design feature on the San Gabriel River Bridges. Before work began on the bridges, Engineer Coleman H. Cook, suggested "perhaps some consideration should be given to the better looking structure."³⁵ Rather ordinary in appearance, the use of non-standard steel picket railing, enhanced by a circular ring motif along the top, gave the bridges a sort of elegance. Along the 40'-0" end or approach spans, the five rail posts are positioned 7'-7" from each other; on the anchor and cantilever spans measuring 76'-6" long, the nine posts are placed 8'-0" apart; and on the 56'-0" suspended spans, three posts rest 7'-10-1/4" apart. The ring insets, 6" in height, are cut from steel, rounded, and welded in place. The cutout circle within the inset measures 1/2" x 3/4". The space between pickets is 6". Workers filled the end-post recesses with concrete after aligning the railing.³⁶

In the spring of 1940, the two bridges opened for traffic. Letters began arriving at the Highway Department commending the new bridges. Engineer Wickline received one letter that sums up the expressions found in most. In one written 9 April, 1940, Dallas resident R. H. Clinger, said that while on a visit to Austin he admired the new bridges near Georgetown [and]

³¹ Microfilm No. 4115-B, 31 January 1939.

³² Information on Name Plates: SAN GABRIEL RIVER BRIDGE, BUILT IN 1939 BY THE TEXAS HIGHWAY DEPARTMENT, UNITED STATES BUREAU OF PUBLIC ROADS, STATE HIGHWAY COMMISSION. Commissioners listed: Brady Gentry, Chairman; Harry Hines, Member; Robert Lee Bobbitt, Member; Julian Montgomery, Highway Engineer; Dean Word, Contractor.

³³ Microfilm Roll No. 4115-B, 31 January 1939.

³⁴ Microfilm Roll No. 4115-B, 13 November 1939.

³⁵ Microfilm Roll No. 4115-B, 22 April 1938.

³⁶ "Plans for Proposed State Highway Improvement."

particularly liked the design. He concluded that he hoped to see more of it.³⁷

The bridges spanning the North and South Forks of the San Gabriel River at Georgetown, Texas, represent a period of experimentation by Texas Department of Highways engineers. There were two ways that the continuous steel girder system with a suspended span proved inadequate. First, designed to carry four-fifteen-ton trucks, with an impact factor of 30 percent, distributed in accordance with American State Highway Offices (ASHO) 1935 specifications, the bridges are inadequate for current traffic.³⁸ According to the Texas Department of Transportation, traffic has increased 129 percent in the past quarter century. The department estimates that about 22,500 vehicles per day will use the bridge in the year 2000.³⁹

Second, corrosion has affected the connections and contributed to the decline of the bridges' integrity, and perhaps jeopardizes their safety in the future. The bridges served their purpose for many years, but are now bypassed by Interstate-35. The explosive growth of Georgetown, indeed, Williamson County, still forces the two bridges to withstand an inordinate amount of use. Currently, the Texas Department of Transportation is exploring plans to either widen or replace this particular stretch of roadway and the bridges serving it.

³⁷ Microfilm Roll No. 4115-B, 9 April 1940.

³⁸ "Plans for Proposed State Highway Improvement."

³⁹ NRHP Evaluation of Eligibility Report. Williamson County, Texas, is reported to be the fastest growing county in the United States in 2000.

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